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09/622,047

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05/23/2006

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EXAMINER

LANIER, BENJAMIN E

ART UNIT

PAPER NUMBER

2132

DATE MAILED: 05/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/622,047

Applicant(s)

MOLDOVYAN ET AL.

Examiner

Benjamin E Lanier

Art Unit

2132

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3 and 5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 April 2006 has been entered.

Response to Amendment

2. Applicant's amendment filed 12 April 2006 amends claims 1, 3, cancels claim 3, and adds claim 5. Applicant's amendment has been fully considered and has been entered.

Response to Arguments

3. Applicant's arguments filed 12 April 2006 have been fully considered but they are not persuasive. Applicant's argument that Schneier does not disclose prior to carrying out said two-place operation on an i -th data subblock and a subkey, an operation of permuting subkey bits is performed on the subkey depending on the value of a j -th data subblock, where i is not equal to j is not persuasive because Schneier discloses the DES algorithm wherein a 64-bit block of plain text is split into a right half and a left half (Page 270), which meets the limitation of breaking down a data block into $N \geq 2$ subblocks. The encryption key is broken up into 16 subkeys (Figure 12.1), which meets the limitation of generating an encryption key in the form of a set of subkeys. There are 16 rounds of identical operations in which the data are combined with the key (Page 270 & Figure 12.1). The operations performed are exclusive or (Xor) operations (Page 270 & Figure 12.1), which meets the limitation of alternatively converting said data subblocks by

Art Unit: 2132

performing a two-place operation on the data subblock and the subkey because figure 12.1 shows the exclusive or operation being performed on the subblock and the subkey. An exclusive or (Xor) operation is a two-place operation. In each round the key bits are shifted depending on a subblock (Page 270 & Figure 12.1), which meets the limitation of prior to carrying out said two-place operation on an I-th data subblock and a subkey, an operation of permuting subkey bits is performed on the subkey depending on the value of the j-th data subblock where i is not equal to j, because figure 12.1 shows that the data subblock Lo is exclusive or'd with the result of the permutation function on subkey Ki that depends on data subblock Ro. Therefore, from figure 12.1 (looking at one round for an example), Lo would meet the limitation of the i-th data subblock, Ro would meet the limitation of the j-th data subblock, K1 would meet the limitation of the subkey being permuted, and function f would meet the limitation of the permutation function.

4. Applicant's arguments that Schneier does not disclose permuting subkey bits depending on data subblock is not persuasive because Schneier clearly discloses that the permutation function f, performs a permutation on the subkey because Schneier routines refers to the "permuted key" (Page 270). This function is clearly dependant on data subblock because the permutation function f, takes as it's inputs (referring specifically to the calculation for R1), subkey K1 and data subblock Ro. Therefore, the permutation function that is performed on subkey K1 is done so dependent upon data subblock Ro that is also taken as an input to the permutation function. Applicant's description of Schneier (last paragraph of page 4 through page 5) does not detail the permutation function in particular as Applicant is alleging. Page 5 is detailing the broadening of the L subblock, which is clearly not part of the permutation function f

Art Unit: 2132

that takes only subkey K_i and data subblock R_o . Applicant further details the exclusive or function, which also is not part of the permutation function f , but is instead the claimed two-place operation performed on the subblock L . Applicant then goes on to describe the s-box and p-box permutations of the DES algorithm that have nothing to do with the permutation function f that takes in only subkey K_1 and data subblock R_o as inputs, and have not been relied upon to teach the claimed invention.

Applicant's last argument also does not take into account that Schneier describes the permutation function f , which provides a "permuted key", takes in subkey K_1 and data subblock R_o (calculation of R_1 used as the example) as inputs. Therefore, the permutation of subblock K_1 is dependant on data subblock R_o .

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3 rejected under 35 U.S.C. 102(b) as being anticipated by Schneier. Referring to claim 1, Schneier discloses the DES algorithm wherein a 64-bit block of plain text is split into a right half and a left half (Page 270), which meets the limitation of breaking down a data block into $N \geq 2$ subblocks. The encryption key is broken up into 16 subkeys (Figure 12.1), which meets the limitation of generating an encryption key in the form of a set of subkeys. There are 16 rounds of identical operations in which the data are combined with the key (Page 270 & Figure 12.1). The operations performed are exclusive or (Xor) operations (Page 270 & Figure 12.1),

Art Unit: 2132

which meets the limitation of alternatively converting said data subblocks by performing a two-place operation on the data subblock and the subkey because figure 12.1 shows the exclusive or operation being performed on the subblock and the subkey. An exclusive or (Xor) operation is a two-place operation. In each round the key bits are shifted depending on a subblock (Page 270 & Figure 12.1), which meets the limitation of prior to carrying out said two-place operation on an i -th data subblock and a subkey, an operation of permuting subkey bits is performed on the subkey depending on the value of the j -th data subblock where i is not equal to j , because figure 12.1 shows that the data subblock L_0 is exclusive or'd with the result of the permutation function on subkey K_i that depends on data subblock R_0 . Therefore, from figure 12.1 (looking at one round for an example), L_0 would meet the limitation of the i -th data subblock, R_0 would meet the limitation of the j -th data subblock, K_1 would meet the limitation of the subkey being permuted, and function f would meet the limitation of the permutation function.

Referring to claim 3, Schneier discloses that each round the subkey bits are shifted depending on a subblock as discussed above (Page 270 & Figure 12.1), which meets the limitation of an operation of an operation of cyclic offsetting subkey bits depending on the j -th subblock is used as the j -th subblock-dependent operation of permuting subkey bits because the permutation function on the subkeys are performed each round and that would be considered cyclical.

Referring to claim 5, Schneier discloses that the subkeys are shifted as a result of a permutation function that depends on the j -th data subblock as discussed above (Page 270 & Figure 12.1). In the later rounds of the algorithm (see figure 12.1, specifically the calculation for R_2), the permutation function operates on subkey K_2 dependant upon the result of R_1 data block

Art Unit: 2132

calculation. The R1 data block calculation involved subkey K1, and therefore, the calculation of R2 also includes data from subkey K1, which meets the limitation of the operation of permuting subkey bits is performed on one of said set of subkeys depending on the value of the j-th data subblock, where i is not equal to j, and the value of another subkey.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin E. Lanier whose telephone number is 571-272-3805. The examiner can normally be reached on M-Th 7:30am-5:00pm, F 7:30am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Benjamin E. Lanier